

1                                   **HAND-CONTROLLED CIRCULAR SAW**

2    BACKGROUND OF THE INVENTION

3    1. Field of the Invention

4           The present invention relates to a circular saw, and more  
5 particularly to a hand-controlled saw having a motor linearly  
6 corresponding to a saw blade of the circular saw.

7    2. Description of Related Art

8           With reference to Fig. 1, a conventional circular saw in accordance  
9 with the prior art comprises a base member (50) having two guiding rods  
10 (51) mounted on a top of the base member (50). A sliding seat (60) is  
11 slidably mounted on the two guiding rods (51) and a motor (70) is laterally  
12 mounted on the sliding seat (60). A housing (80) is pivotally connected to  
13 the motor (70) and a saw blade (90) is laterally pivotally connected to the  
14 housing (80) and partially received in the housing (80). For easily driving  
15 the saw blade (90), the motor (70) perpendicularly corresponds to the saw  
16 blade (90).

17           However, the motor (70) laterally corresponds to a moving  
18 direction of the saw blade (90) such that the total width of the motor (70)  
19 and the housing (80) is lengthened. Consequently, the motor (70) and the  
20 housing (80) cover a great area when the saw blade (90) is moved to cut  
21 the workpiece. As a result, the user needs to prepare a great work place to  
22 prevent the motor (70) from bumping the articles beside the circular saw  
23 when the motor (70) is moved.

24           The present invention has arisen to mitigate and/or obviate the  
25 disadvantages of the conventional hand-controlled circular saw.

1     SUMMARY OF THE INVENTION

2             The main objective of the present invention is to provide an  
3     improved circular saw that the saw blade and the motor linearly  
4     correspond to each other.

5             To achieve the objective, the circular saw in accordance with the  
6     present invention comprises a universal arm mounted to a rear end of a  
7     base member of the circular saw. A housing with a saw blade is securely  
8     connected to the universal arm. A drive device is longitudinally mounted  
9     to the housing for driving the saw blade and includes a casing secured on  
10    the housing. A motor is securely received in the casing and radially  
11    corresponding to the saw blade along a moving direction of the saw blade.  
12    A worm is longitudinally secured on a free end of the shaft extending from  
13    the motor. A worm gear is laterally rotatably mounted to the casing and  
14    engaged to the worm. An endless belt is mounted and surrounding a first  
15    belt wheel extending from the saw blade and the second belt wheel  
16    extending from the worm gear for driving the saw blade when the motor is  
17    operated.

18            Further benefits and advantages of the present invention will  
19    become apparent after a careful reading of the detailed description with  
20    appropriate reference to the accompanying drawings.

21     BRIEF DESCRIPTION OF THE DRAWINGS

22            Fig. 1 is a perspective view of a conventional hand-controlled  
23    circular saw in accordance with the prior art;

24            Fig. 2 is a perspective view of a hand-controlled circular saw in

1 accordance with the present invention;

2 Fig. 3 is a side plan view in partial cross-section of the circular saw  
3 in Fig. 2;

4 Fig. 4 is a partially enlarged side plan view in partial cross-section  
5 of the circular saw in Fig. 2;

6 Fig. 5 is a top plan view in partial cross-section of the circular saw  
7 in Fig. 2; and

8 Fig. 6 is a partially enlarged top plan view in partial cross-section  
9 of the circular saw in Fig. 2.

## 10 DETAILED DESCRIPTION OF THE INVENTION

11 With reference to the drawings and initially to Figs. 2 and 3, a  
12 hand-controlled circular saw in accordance with the present invention  
13 comprises base member (10), a universal arm (20) pivotally mounted to  
14 the base member (10), a housing (30) with a saw blade (300) securely  
15 connected to the universal arm (20) and a drive assembly (40)  
16 longitudinally mounted to the housing (30) for driving the saw blade  
17 (300).

18 The base member (10) includes a supporting seat (11) pivotally  
19 mounted to a rear end of the base member (10) and two connecting rods  
20 (12) upwardly extending from the supporting seat (11). The two  
21 connecting rods (12) form a V-shape.

22 The universal arm (20) includes a first linkage set (21) and a  
23 second linkage set (22) respectively pivotally connected to a  
24 corresponding one of the two connecting rods (12) of the base member

1 (10). The first linkage set (21) and the second linkage set (22) correspond  
2 to each other. The first linkage set (21) includes a first linkage (211)  
3 having a first end pivotally connected to a free end of a corresponding one  
4 of the two connecting rods (12) and a second end opposite to the first end  
5 of the first linkage (211), and a second linkage (212) having a first end  
6 pivotally connected to a second end of the first linkage (211) and a second  
7 end opposite to the first end of the second linkage (212). The structure of  
8 the second linkage set (22) is the same as that of the first linkage set (21)  
9 and has a first linkage (221) pivotally connected to a corresponding one  
10 the two connecting rods (12) and a second linkage (222) pivotally  
11 connected to the first linkage (221) of the second linkage set (22). A  
12 connector (23) is pivotally connected to the second end of each of the  
13 second linkages (212, 222).

14 The housing (30) is longitudinally and pivotally connected to the  
15 connector (23) and the saw blade (300) is pivotally laterally mounted to  
16 the housing (30) and partially received in the housing (30). The housing  
17 (30) is reciprocally circularly moved relative to the connector (23). The  
18 saw blade (300) has a first belt wheel (301) laterally and centrally  
19 extending therefrom. A handle (31) is formed on the housing (30) opposite  
20 to the connector (23) for user to control the circular saw.

21 With reference to Figs. 4-6, the drive device (40) includes a casing  
22 (41) securely connected to the housing (30). A motor (42) is securely  
23 received in the casing (41) and radially corresponding to the saw blade  
24 (300) along a moving direction of the saw blade (300). The motor (42)

1 includes a shaft (421) rotatably extending from the motor (42) and a worm  
2 (422) longitudinally secured on a free end of the shaft (421). A worm gear  
3 (423) is laterally rotatably mounted to the casing (41) and engaged to the  
4 worm (422). The worm gear (423) has a second belt wheel (424) laterally  
5 centrally extending from the worm gear (423). An endless belt (43) is  
6 mounted and surrounds the first belt wheel (301) and the second belt  
7 wheel (424). Consequently, the saw blade (300) rotates for cutting the  
8 workpiece due to the belt (43), the worm gear (423) and the worm (422)  
9 when the motor (42) is operated.

10 As described above, the hand-controlled circular saw in  
11 accordance with the present invention has the following advantages.

12 1. The motor (42) of the present invention longitudinally  
13 corresponds to a moving direction of the saw blade (300) such that the  
14 total width of the motor (42) and the housing (30) is reduced to prevent the  
15 motor (42) from bumping an article that is closed to circular saw.

16 2. The worm (422) and the worm gear (423) are further used as a  
17 gear reducer for providing a fixed and powerful output.

18 3. All the elements of the drive assembly (4) are received in the  
19 casing (41) such that noise of the circular saw is effectively reduced.

20 4. The universal arm (20) is universally moved such that the user  
21 can conveniently operate the circular saw in accordance with the present  
22 invention.

23 Although the invention has been explained in relation to its  
24 preferred embodiment, it is to be understood that many other possible

- 1 modifications and variations can be made without departing from the spirit
- 2 and scope of the invention as hereinafter claimed.